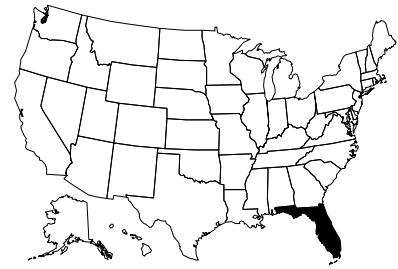


# FLORIDA

## Contact Information

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FDEP Bioassessment homepage: <http://www.dep.state.fl.us/water/bioassess/index.htm>



## Program Description

Biological sampling has been one component of the Florida Department of Environmental Protection's (FDEP) overall monitoring strategy since the early 1970s. The Bioassessment Program, in its current manifestation, has been in existence since 1992, in response to the need for tools that would detect and characterize the nature and extent of nonpoint source pollution (*sensu* the 319 program). The primary goal of FDEP's bioassessment activities are to determine the biological health, or degree of impairment, in the State's surface waters. The biological assessment results are heavily utilized by a number of FDEP programs for making informed environmental decisions:

- Total Maximum Daily Load (303(d)) program – determining the impairment status of waterbodies for potential inclusion on the 303(d) list
- The National Pollutant Discharge Elimination System (NPDES) program – determining effectiveness of discharge permit limits
- Nonpoint Source Program – targeting areas with nonpoint source problems and determining the effectiveness of Best Management Practices
- Rotating Basin Assessment program – overall assessment of all human activities in a watershed
- Mine Reclamation program – determining the success of mitigation efforts
- FDEP's Division of Waste Management – ensuring that clean up efforts are sufficient to protect aquatic life adjacent to waste clean up sites (e.g., RCRA).

Biological data are used in Florida's 305(b) report as one of the key pieces of Aquatic Life Use Support (ALUS) information for determining if a waterbody meets its designated use. Bioassessment data are also used for establishing the impairment status of a waterbody for 303(d) listing purposes.

After recalibration of bioassessment metrics and indices (currently underway), it is anticipated that Florida's water quality standards (Rule 62.302 Florida Administrative Code) will be revised accordingly. Although the primary target community for the bioassessment program is currently benthic macroinvertebrates, Florida is also working on potential assessment methods that use algal and vascular plant assemblages. While multimetric biological indices are currently complete for streams, rivers, and lakes, it is anticipated that ongoing index development for wetlands and estuaries will be finalized over the next several years.

The most important recent accomplishment of the Bioassessment Program has been the inclusion of the Stream Condition Index, the BioRecon, and Lake Condition Index as impairment indicator tools in Florida's Impaired Waters Rule (IWR), Rule 62-303, FAC. The IWR is a new administrative code that provides detailed specifications for how surface waters are determined to be impaired for Section 303(d) listing. Future challenges include incorporating the bioassessment tools into a Statewide probabilistic survey design, as well as continuing to meet the increasing demands for biological tools and data.

## Documentation and Further Information

2000 Florida Water Quality Assessment 305(b) Report: <http://www.dep.state.fl.us/water/305b/index.htm>

Numerous technical reports are available online at <http://www.dep.state.fl.us/labs/reports/index.htm> and <http://www.dep.state.fl.us/water/bioassess/pubs.htm>

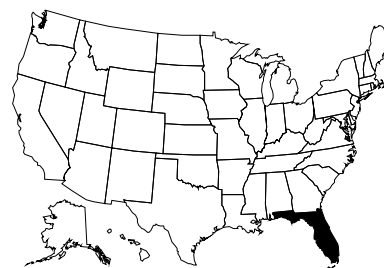
For an online collection of FDEP standard operating procedures, go to:  
<http://www.dep.state.fl.us/labs/qa/sops.htm>

Surface Water Quality Classifications: <http://www.dep.state.fl.us/water/surfacewater/index.htm>

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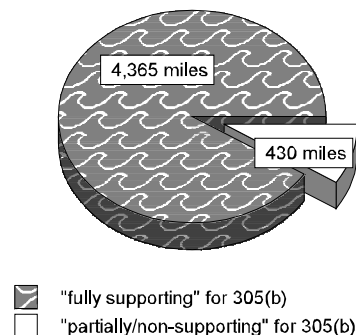
## Programmatic Elements

<b>Uses of bioassessment within overall water quality program</b>	<input checked="" type="checkbox"/>	problem identification (screening)
	<input checked="" type="checkbox"/>	nonpoint source assessments
	<input checked="" type="checkbox"/>	monitoring the effectiveness of BMPs
	<input checked="" type="checkbox"/>	ALU determinations/ambient monitoring
	<input checked="" type="checkbox"/>	promulgated into state water quality standards as biocriteria
	<input checked="" type="checkbox"/>	support of antidegradation
	<input checked="" type="checkbox"/>	evaluation of discharge permit conditions
	<input checked="" type="checkbox"/>	TMDL assessment and monitoring
	<input checked="" type="checkbox"/>	other: biocriteria development
<b>Applicable monitoring designs</b>	<input checked="" type="checkbox"/>	targeted (i.e., sites selected for specific purpose) ( <i>comprehensive use throughout jurisdiction</i> )
	<input type="checkbox"/>	fixed station (i.e., water quality monitoring stations)
	<input type="checkbox"/>	probabilistic by stream order/catchment area
	<input type="checkbox"/>	probabilistic by ecoregion, or statewide
	<input checked="" type="checkbox"/>	rotating basin ( <i>5-year rotation, comprehensive use throughout jurisdiction</i> )
	<input type="checkbox"/>	other:

## Stream Miles

<b>Total miles</b>	<b>51,858</b>
<i>(determined using waterbody identification- segment of stream, generally 5 mile increments)</i>	
Total perennial miles	22,993
<b>Total miles assessed for biology</b>	<b>4,795</b>
fully supporting for 305(b)	4,365
partially/non-supporting for 305(b)	430
listed for 303(d)	430
number of sites sampled (over 2 years)	959
number of miles assessed per site	5

## 4,795 Miles Assessed for Biology



## Aquatic Life Use (ALU) Designations and Decision-Making

<b>ALU designation basis</b>	Single aquatic life use
<b>ALU designations in state water quality standards</b>	One designation: propagation of a healthy, well balanced fish and wildlife community
<b>Narrative Biocriteria in WQS</b>	Procedures used to support narrative biocriteria located in FDEP's Standard Operating Procedures
<b>Numeric Biocriteria in WQS</b>	Numeric biocriteria located in Rule 62-302 Florida Administrative Code – "Shannon-Weaver diversity shall not be reduced more than 25% of background conditions" *
<b>Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)</b>	<input checked="" type="checkbox"/> assessment of aquatic resources <input checked="" type="checkbox"/> cause and effect determinations <input checked="" type="checkbox"/> permitted discharges <input checked="" type="checkbox"/> monitoring (e.g., improvements after mitigation) <input checked="" type="checkbox"/> watershed based management
<b>Uses of bioassessment/biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU</b>	TMDLs, restoration/mitigation studies, BMP effectiveness studies, discharge permit renewal

\*Florida has made substantial progress in developing new multimetric indices for streams (Stream Condition Index and BioRecon), lakes (Lake Condition Index), and wetlands for eventual inclusion in the Florida Administrative Code. When the new indices are adopted as water quality standards, the role of Shannon-Weaver diversity as a numeric standard will be re-evaluated.

## Reference Site/Condition Development

<b>Number of reference sites</b>	<b>150 total</b>
<b>Reference site determinations</b>	<input type="checkbox"/> site-specific <input type="checkbox"/> paired watersheds <input checked="" type="checkbox"/> regional (aggregate of sites) <input checked="" type="checkbox"/> professional judgment <input type="checkbox"/> other:
<b>Reference site criteria</b>	least impaired by human activities in a region, optimal habitat, benign land use in watershed, uncontaminated water quality, undisturbed hydrology
<b>Characterization of reference sites within a regional context</b>	<input type="checkbox"/> historical conditions <input checked="" type="checkbox"/> least disturbed sites <input checked="" type="checkbox"/> gradient response ( <i>for recalibration of existing indexes</i> ) <input type="checkbox"/> professional judgment <input type="checkbox"/> other:
<b>Stream stratification within regional reference conditions</b>	<input checked="" type="checkbox"/> ecoregions (or some aggregate) <input type="checkbox"/> elevation <input type="checkbox"/> stream type <input type="checkbox"/> multivariate grouping <input type="checkbox"/> jurisdictional (i.e., statewide) <input type="checkbox"/> other:
<b>Additional information</b>	<input type="checkbox"/> reference sites linked to ALU <input type="checkbox"/> reference sites/condition referenced in water quality standards <input checked="" type="checkbox"/> some reference sites represent acceptable human-induced conditions

## Field and Lab Methods

<b>Assemblages assessed</b>	<input checked="" type="checkbox"/>	benthos ( <i>100-500 samples/year; single season, multiple sites - watershed level</i> )
	<input type="checkbox"/>	fish
	<input checked="" type="checkbox"/>	periphyton ( <i>100-500 samples/year; single season, multiple sites - not at watershed level</i> )
	<input checked="" type="checkbox"/>	other: phytoplankton, macrophytes ( <i>100-500 samples/year; single observation, limited sampling</i> )
<b>Benthos</b>		
sampling gear		d-frame, dipnet (500-600 micron mesh), multiplate (Hester-Dendys)
habitat selection		multihabitat (snags, roots, leaf packs, aquatic vegetation)
subsample size		100-count target
taxonomy		species level (where possible)
<b>Periphyton</b>		
sampling gear		<b>natural substrate:</b> brushing/scraping device (razor, toothbrush, etc.), collect by hand <b>artificial substrate:</b> periphytometer, microslides or other suitable substratum
habitat selection		multihabitat
sample processing		chlorophyll <i>a</i> /phaeophytin, taxonomic identification
taxonomy		all algae, species level (diatoms to variety level)
<b>Habitat assessments</b>		
		visual based; performed with bioassessments
<b>Quality assurance program elements</b>		
		standard operating procedures, quality assurance plan, periodic meetings and training for biologists, sorting and taxonomic proficiency checks, specimen archival, habitat assessment tests, sampling field audits, sampling variability studies, performance testing program for bioassessment

## Data Analysis and Interpretation

<b>Data analysis tools and methods</b>	<input checked="" type="checkbox"/>	summary tables, illustrative graphs
	<input type="checkbox"/>	parametric ANOVAs
	<input type="checkbox"/>	multivariate analysis
	<input checked="" type="checkbox"/>	biological metrics ( <i>aggregate metrics into an index</i> )
	<input checked="" type="checkbox"/>	disturbance gradients
	<input type="checkbox"/>	other:
<b>Multimetric thresholds</b>		
transforming metrics into unitless scores		25 <sup>th</sup> percentile of reference population
defining impairment in a multimetric index		quadrascction of best score
<b>Evaluation of performance characteristics</b>	<input checked="" type="checkbox"/>	repeat sampling ( <i>same team, same reach; different teams in same reach</i> )
	<input checked="" type="checkbox"/>	precision ( <i>coefficient of variation</i> )
	<input type="checkbox"/>	sensitivity
	<input type="checkbox"/>	bias
	<input checked="" type="checkbox"/>	accuracy ( <i>species accumulation</i> )
<b>Biological data</b>		
Storage		custom Oracle-based program, "S-BIO"
Retrieval and analysis		custom Oracle-based program, "S-BIO"